THE DEVELOPMENT OF THE PERUVIAN ALFALFA INDUSTRY IN THE UNITED STATES

H. L. WESTOVER
Agronomist, Office of Forage-Crop Investigations

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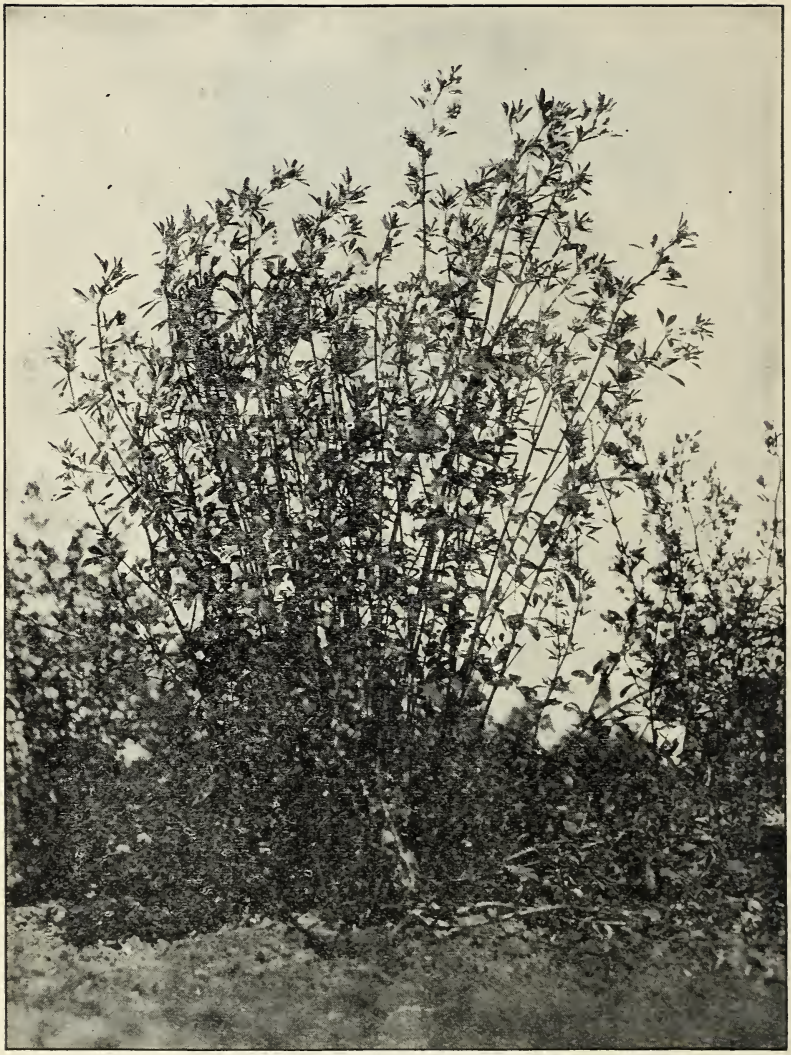

Fig. 1.—A Typical Plant of True or Hairy Peruvian Alfalfa.

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Of the alfalfas introduced from Peru, two distinct strains are at present quite generally recognized in the United States. These strains differ more or less in several respects, but most noticeably in the abundance of hairs on the stems and leaves. It is because of this difference that such names as "smooth-leaved Peruvian" and "hairy Peruvian" as applied to these alfalfas have come into general use. In this paper, however, for reasons that will be discussed fully later, the name "Peruvian alfalfa" will be used exclusively in connection with the more hairy type.

While it is a well-known fact that the Peruvian alfalfa now grown in this country is the progeny of a direct importation from Peru, there is more or less confusion regarding the origin of the so-called "smooth Peruvian" alfalfa. An impression that it is the result of a natural cross between the common and Peruvian alfalfas that has developed since the introduction of the latter into this country has gained some foothold. There is some ground for the opinion that the "smooth Peruvian" is a hybrid alfalfa, but if it is a hybrid the original crossing undoubtedly took place before its introduction into the United States, although unquestionably there has been further crossing since that time. That a marked difference in these two alfalfas existed when they were first introduced can perhaps best be established through a careful examination of the results secured with the seed of the original importations in so far as available records permit.

The first recorded introduction of alfalfa into the United States from Peru was made in May, 1899, under S. P. I No. 3075,[1] but unfortunately there are no available records as to the results that were secured with this introduction. About two months later, another introduction was made under S. P. I. No. 3399, which was tried at Chico, Calif., and at other points. This is one of the introductions upon which the earlier data on the superior qualities of the Peruvian alfalfa were based. While S. P. I. No. 3399 was grown in an experimental way at least as early as 1904, neither the plants bearing this number nor those bearing S. P. I. No. 3075 were perpetuated. The first Peruvian introduction whose progeny is being grown com-

[1] The record number of the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry.

mercially in this country was made in 1903 under S. P. I. No. 9303. It appears from the earlier experiments as well as from plantings made in 1918 with seed of the original importations of S. P. I. Nos. 3399 and 9303 that the two introductions are identical in every respect.

So far as can be ascertained from the available records, the first seeding of Peruvian alfalfa in the Yuma Valley was made in the spring of 1906 with S. P. I. No. 9303. The early seeding made here and at other points in the Southwest demonstrated quite definitely the superiority of the Peruvian alfalfa for these sections, and in an effort to increase the seed as rapidly as possible considerable transplanting was done. The seed from these transplanted plants was given S. P. I. No. 24598. It was under this number that the seed of Peruvian alfalfa was first distributed to the farmers. The increase in seed was not as rapid as seemed desirable, and in 1908, through the efforts of the United States Department of Agriculture, a considerable quantity of seed was procured from Peru under S. P. I. No. 22834. This seed was purchased from the same firm that supplied S. P. I. No. 9303, and the two lots were represented as being identical.

By this time several farmers had become interested in the Peruvian alfalfa, and in the late winter and early spring of 1908 a few of them were supplied with sufficient seed of the latest importation, S. P. I. No. 22834, for 1 to 5 acres of land. One of these farmers received seed of two S. P. I. numbers, viz, 22834 and 24598, the latter being the number given to the seed obtained from the transplanted plants of S. P. I. No. 9303. He soon recognized the differences in these two lots of alfalfa and two or three years later suggested that the Department of Agriculture give some other name than Peruvian to the second introduction (i. e., S. P. I. No. 22834), which proved so much like common alfalfa. The employees of the United States Department of Agriculture who were conducting the experiments with Peruvian alfalfa at that time had already made the observation that the latest importation from Peru (i. e., S. P. I. No. 22834) was less hairy, shorter, and somewhat slower in growth than S. P. I. No. 9303 and agreed that the former should be given a different name. Unfortunately, nothing was done regarding the matter, and a little later, in 1912 and 1913, for want of a better designation, seed of these two alfalfas was placed on the market as Peruvian No. 1 and Peruvian No. 2, No. 1 referring to the progeny of S. P. I. No. 9303 (24598), and No. 2 referring to the progeny of S. P. I. No. 22834. It is quite evident that a designation of this sort would be open to many objections, and a little later the alfalfa seed growers' organization of the Yuma Valley adopted "hair-leaved Peruvian" for the progeny of S. P. I. No. 9303 (24598), and "smooth-leaved

Peruvian" for the progeny of S. P. I. No. 22834. As might be expected, the seed trade found these names entirely too cumbersome, and these alfalfas are now usually found catalogued as "smooth Peruvian" and "hairy Peruvian" or simply as Peruvian and "hairy Peruvian." Thus, we find that the designations "Peruvian No. 1," "hairy-leaved Peruvian," "hairy Peruvian," and "S. P. I. No. 24598" have all been applied to the progeny of S. P. I. No. 9303, while "Peruvian No. 2," "smooth-leaved Peruvian," "smooth Peruvian," and "Peruvian" have been used at various times to designate the progeny of S. P. I. No. 22834.

It should not be inferred, however, that all the introductions of alfalfa from Peru fall into one of these classes. Several lots of seed have been received of plants that have variegated flowers and in all other characteristics are quite similar to our hardy alfalfas, such as the Grimm and Baltic. These introductions have never been developed commercially, as they do not appear to possess any qualities superior to the varieties already on the market.

It is very unfortunate that the names "smooth-leaved Peruvian" and "smooth Peruvian" should have come into such general use in connection with this alfalfa, as the descriptive terms are not only misleading but lead to confusion in the seed trade. The stems and leaves of this strain are by no means smooth, as the name as commonly used would imply. It is true that the hairs are less abundant than on the true Peruvian alfalfa, but when the plants are carefully examined hairs will be found in considerable abundance. In this respect this strain will not be found markedly different from the common Arizona alfalfa. It is also to be regretted that the word "Peruvian" should ever have been applied to this alfalfa, for the reason that for some time "Peruvian alfalfa" had been the recognized name for the more hairy type of alfalfa introduced from Peru which represented the earlier importations. This alfalfa had for some time been recognized as a distinct variety and had been described botanically as such under the name *Medicago sativa* var. *polia* by Brand.[1]

In the early years of the Peruvian alfalfa industry in the Yuma Valley there was on the market a considerable preponderance of seed of the so-called "smooth-leaved Peruvian," as the original seedings among farmers comprised about 8 acres of this alfalfa and only 1 of the true Peruvian. One farmer had all of the original seeding of the true Peruvian alfalfa and 7 acres of the "smooth Peruvian." The latter he allowed to remain for six years, or until 1915. So far as the records show, all the commercial lots of the Peruvian as well as the "smooth Peruvian" alfalfa in the United States at the

[1] Brand, C. J. Peruvian alfalfa: A new long-season variety for the Southwest. U. S. Dept. of Agr., Bur. Plant Indus. Bul. 118, p. 23. 1907.

present time trace back to these original seedings made on this one farm. However, since the superiority of the true Peruvian has come to be more generally recognized there has been a gradual decrease in the acreage of the "smooth-leaved Peruvian" and a proportionate increase in the acreage of the true Peruvian. This difference will doubtless be more marked in the future, since the big increase in the cotton acreage in the Yuma Valley in 1917 and 1918 has resulted in the plowing up of many old alfalfa fields. As this land is put back to alfalfa, a much greater proportion of it is being seeded to the Peruvian variety than formerly, as that variety has given somewhat heavier yields than either the "smooth Peruvian" or the common alfalfas, and also because a demand greater than the supply has resulted in a much higher price for this seed than for other varieties and strains grown in the valley.

The investigations that have been conducted thus far indicate quite definitely that for most parts of the Southwest the true Peruvian alfalfa is superior to the smoother type. The former not only grows more rapidly, thus giving a somewhat greater tonnage of hay, but also makes more growth during the winter months, thereby furnishing a larger quantity of pasturage. However, if the true Peruvian alfalfa were no more than equal to the "smooth Peruvian" in point of yield, the fact that the former has characteristics by which it may be readily distinguished from common alfalfa, while the "smooth Peruvian" is so similar to the common alfalfa that it is often difficult to distinguish between the two, is sufficient ground for discouraging the use of the term "smooth Peruvian" alfalfa. Because the true Peruvian alfalfa may be readily distinguished, even by the inexperienced, from the alfalfa commonly grown in Arizona, unscrupulous dealers are loath to handle this seed, preferring to handle the "smooth Peruvian," which gives them an opportunity to buy mixed lots of seed at the price of common alfalfa and sell it as "smooth Peruvian" at a price considerably in advance of the price they could get for seed of the former. For this reason they are continually emphasizing the advantages of the "smooth Peruvian" as compared with the true Peruvian alfalfa.

As compared with common alfalfa, both the Peruvian and "smooth Peruvian" alfalfas are more upright, less branched, and have fewer and somewhat coarser stems and smaller crowns. (Fig. 1.) In thick stands, these differences are hardly noticeable. Most of the Peruvian introductions are also characterized by rapid growth, quick recovery after cutting, and in sections having a mild climate ability to make growth in cool weather after ordinary alfalfas have ceased growing. Under such conditions the former starts growth earlier in the spring and continues later in the fall, thereby giving

more cuttings each season. The principal objection advanced in times past to these alfalfas is their tendency to become somewhat woody when allowed to stand beyond the flowering stage, but this difficulty is easily obviated by harvesting earlier.

Lack of hardiness will always confine the successful production of the true and smooth Peruvian alfalfas to the southern and southwestern portions of the United States, where the climatic conditions are comparatively mild. They can not be grown to advantage where the winter temperature falls below 10° F.

At the present time most of the Peruvian and smooth Peruvian alfalfa in the United States is found in Arizona and California. It has also been grown to a limited extent in New Mexico, Texas, and the coastal regions of the Southeastern States. The results secured seem to indicate that in much of this region the common alfalfa could be replaced very profitably by Peruvian alfalfa. The accompanying map (fig. 2) shows the region where Peruvian alfalfa is already or gives promise of being the most satisfactory variety in that part of the United States lying west of the ninety-fifth meridian. This region, however, includes a considerable area of land that is not suited to the production of any variety of alfalfa. In the southeastern part of the United States the soil and climatic conditions for the most part do not favor the production of alfalfa, but where any variety of alfalfa can be profitably grown in a comparatively narrow strip of land along the Gulf coast and thence northwest along the Atlantic coast to the vicinity of Charleston, S. C., the Peruvian alfalfa should give the best results.

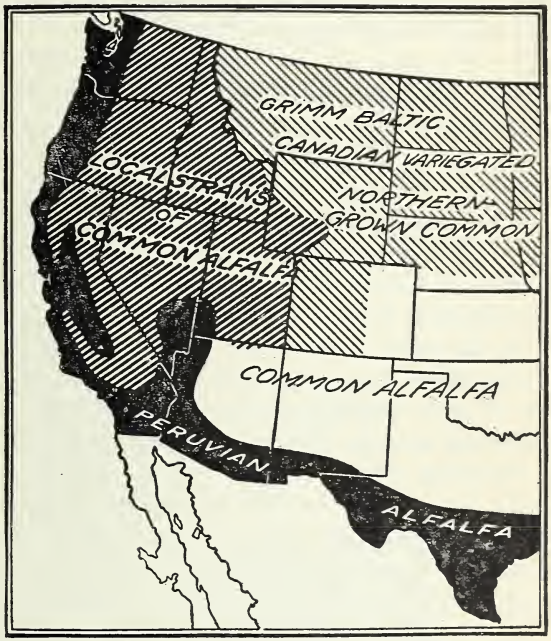

FIG. 2.—Map of the western portion of the United States, showing the varieties or strains of alfalfa that in general are recommended for the various sections.

SUMMARY.

Peruvian alfalfa was first introduced into the United States from South America in 1899, but the earliest introductions were not perpetuated.

Another introduction was made in 1903 under S. P. I. No. 9303, and it is the progeny of this introduction that constitutes the true Peruvian alfalfa of the United States at the present time.

Some of the plants obtained from the first seeding in the Yuma Valley were later transplanted, and the seed from these transplantings was given S. P. I. No. 24598. It was under this number that the seed was distributed to farmers.

In 1908 a lot of seed was procured from Peru under S. P. I. No. 22834. This was supposed to be identical with S. P. I. No. 9303, but later was found to be characterized by fewer hairs on stems and leaves and by slower and shorter growth. This introduction was given the name of "smooth-leaved Peruvian" by local growers.

The name "Peruvian" was first used in connection with the more hairy alfalfa from Peru, and it is unfortunate that the same descriptive term should have been used in connection with the smoother introduction from Peru, as it leads to confusion in the seed trade.

In the early years of the Peruvian alfalfa industry in the Yuma Valley there was a preponderance of seed of the "smooth Peruvian," but in more recent years there has been a decided increase in the proportional acreage of the true Peruvian alfalfa.

Peruvian alfalfa may be readily distinguished from common alfalfa, but it is more difficult to distinguish the "smooth Peruvian" from the common, and as a result unscrupulous dealers prefer to handle "smooth Peruvian," as it gives them a better opportunity to dispose of mixed lots of seed without their being readily detected.

As compared with common alfalfa, Peruvian is more upright, less branched, and has fewer stems and smaller crowns. It is also characterized by rapid growth, quick recovery after cutting, and ability to grow in cooler weather than common alfalfa.

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